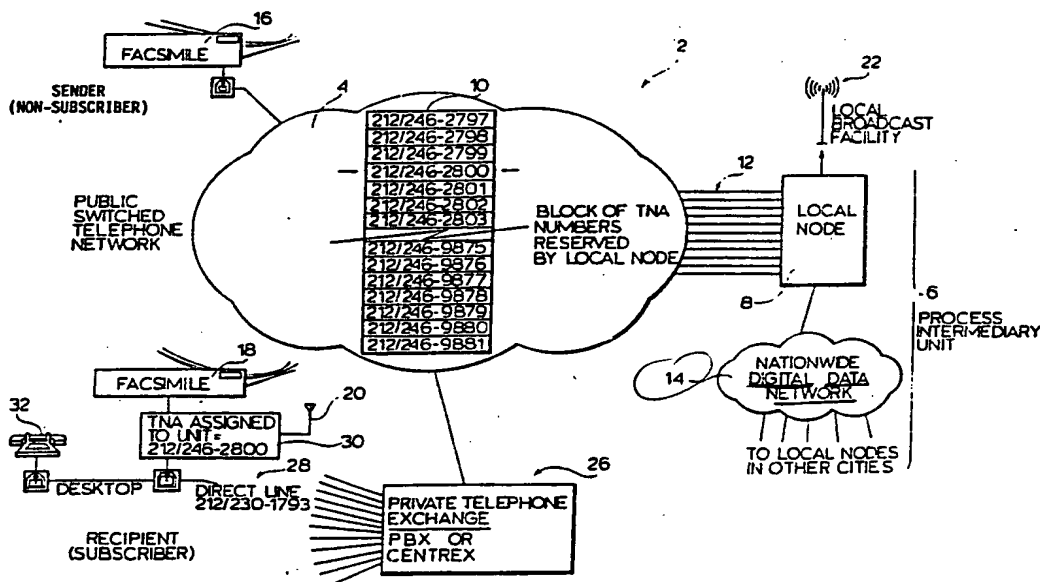


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : H04M 11/00	A1	(11) International Publication Number: WO 91/17618 (43) International Publication Date: 14 November 1991 (14.11.91)
<p>(21) International Application Number: PCT/CA90/00150</p> <p>(22) International Filing Date: 9 May 1990 (09.05.90)</p> <p>(71) Applicant: ALPHANET TELECOM INC. [CA/CA]; 61 Dalewood Road, Toronto, Ontario M4P 2N4 (CA).</p> <p>(72) Inventors: GORDON, Alastair, T. ; 61 Dalewood Road, Toronto, Ontario M4P 2N4 (CA). REICHMANN, Michael, J. ; 137 Blantyre Avenue, Toronto, Ontario M1N 2R6 (CA).</p> <p>(74) Agents: HALL, S., Warren et al.; Dennis & Associates, 133 Richmond St. W., Suite 301, Toronto, Ontario M5H 2L7 (CA).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent)*, DK (European patent), ES (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), SU.</p> <p>Published With international search report.</p>

(54) Title: DATA TRANSMISSION ARRANGEMENT



(57) Abstract

An improved data transmission system (2) which uses the telephone system (4) for transmitting information between data transmitting/receiving devices (16, 18) via a process intermediary (6) is taught wherein at least some of the data transmitting/receiving devices (18) can be actuated by a non-telephone actuation signal controlled by the process intermediary (6). Telephone number addresses (10) are obtained by the process intermediary (6) and assigned to uniquely identify non-telephone actuable data transmitting/receiving devices (18). The telephone number addresses (10) when used to transmit data to the assigned data transmitting/receiving device (18) results in the transmitted data being received by the process intermediary (6) and forwarded to the appropriate data transmitting/receiving device (18) by actuating the device (18) by means of a non-telephone actuation signal. This actuation signal causes the device (18) to initiate a telephone communication with the process intermediary (6) and thereby receive the transmitted data. In this way, the transmission of data to the data transmitting/receiving device (18) identified by a telephone number address (10) is essentially transparent to the originating data transmitting/receiving device (16, 18).

DESIGNATIONS OF "DE"

Until further notice, any designation of "DE" in any international application whose international filing date is prior to October 3, 1990, shall have effect in the territory of the Federal Republic of Germany with the exception of the territory of the former German Democratic Republic.

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TITLE: DATA TRANSMISSION ARRANGEMENTFIELD OF THE INVENTION

The present invention relates to data
5 transmission systems and, in particular, to data
transmission systems involving public switched telephone
networks and transmission of data from an originating data
transmitting/receiving device to a destined data
transmitting/receiving device via a process intermediary.

BACKGROUND OF THE INVENTION

Apparatus and various methods for transmitting
data between an originating transmitting/receiving device
and a destined transmitting/receiving device are taught in
15 United States Patent 4,713,837. According to the
structure of the patent, the destined transmitting/
receiving device does not require a dedicated telephone
line, as a non-telephone actuation signal is transmitted
by the process intermediary to the destined transmitting/
20 receiving device causing the destined transmitting/
receiving device to complete a telephone communication
with the process intermediary for the delivery of data.

Although this system eliminates the need for a
dedicated line, there remains a problem, as the
25 transmission of data to the destined transmitting/receiving
device does not occur in the manner of data transmissions
between data transmitting/receiving devices having
dedicated lines. It would be desirable to have a system
where the data is transmitted, from the originating
30 transmitting/receiving device to the process intermediary
and subsequently to the destined transmitting/receiving
device, in a manner which appears to be identical to
transmissions using dedicated lines.

SUMMARY OF THE INVENTION

According to the present invention, the process
intermediary leases or otherwise obtains from the public
switched telephone network a plurality of telephone number

addresses which are separately allocated to particular data transmitting/receiving terminals, preferably facsimile machines. These telephone number addresses will be used as a unique address for each of the subscribing data transmitting/receiving devices, however, when this telephone number address is used, the data will be routed from the originating transmitting/receiving device to the process intermediary. The process intermediary then, based on the telephone number address, creates a non-telephone signal to actuate or otherwise advise the destined transmitting/receiving device of the receipt of an addressed data message. Once actuated, the destined transmitting/receiving device forms a telephone communication between the process intermediary and the destined device for delivery of the data.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the invention are shown in the drawings, wherein:

Figure 1 is a representation of the data transmission system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The data transmission system generally shown as 2 is obviously much more complex in that it is capable of communicating with other telephone networks. Generally, data transmission systems involve public switched telephone networks 4 from which the process intermediary 6, having local nodes 8, purchases or leases a block of telephone number addresses (TNA's) 10. These telephone number addresses are connected to the local node 8 by a number of trunk lines, generally indicated as 12. The telephone number address numbers 10 are sometimes referred to as DID numbers in the case of a private company leasing such addresses with DID standing for "direct in-dial" numbers. In any event, these numbers do not represent dedicated telephone lines, but merely telephone addresses which when used, result in a communication with the local

node given that a trunk line is available.

The cost associated with reserving a TNA number is much less than the charge for a dedicated telephone line. In this way, the local node 8 can have many subscribers with each of these subscribers having a unique TNA number with a significantly less number of trunk lines for servicing of these subscribers. Thus, the cost to the local node, to assign a telephone number address to a facsimile machine or other data transmitting/receiving device, is much less than the cost for a dedicated telephone line. The local node 8 is connected to a digital data network 14 whereby the data, transmitted from one transmitting/receiving device to another, can be transmitted between local nodes 8 of the digital data network. In this way, long distance charges associated with a conventional telephone communication are replaced by a significantly reduced expense incurred for transmitting over the digital data network. Other advantages flow from the use of the digital data network, such as higher speed, improved accuracy, better quality control, etc.

The term Digital data network, as used in the present application, refers to digital data networks designed for the efficient communication of electronic messages between electronic data terminals, and this term does not include networks capable of transmitting real time continuous voice communications. Therefore, conventional public switched telephone networks are not digital data networks as used in the present application.

In order to more fully understand the data transmission system, consider that facsimile machine 16, the originating transmitting/receiving device, is about to send a data transmission to the destined transmitting/receiving device, facsimile machine 18. The destined facsimile machine 18 has a unique TNA number assigned thereto. Facsimile machine 16 then transmits the data in the traditional manner, however, in transmitting this data it uses the TNA number which effectively connects

facsimile machine 16 with the local node 8 as the call is received on one of the trunk lines 12. The telephone number address is communicated to, and noted by, the local node 8 upon receipt of the call at a trunk line 12.

5 Preferably, an actuation signal is immediately sent out over the local broadcast facility indicated as 22 with the computer logic 30, which includes broadcast receiving capability, of the facsimile machine 18 effectively
10 listening for an actuation signal received by the associated antenna 20 connected thereto. This arrangement is described in U.S. Patent 4,713,837 incorporated herein by reference.

Upon recognizing its actuation signal, the computer logic 30, which can be integral with or connected
15 to the facsimile machine 18, completes a telephone communication with the local node 8 over the shared direct line 28 having the associated private telephone exchange 26. Once connected, the data which was received from the facsimile machine 16 by the local node can be transmitted
20 to facsimile machine 18. In some cases, the actuation will occur almost simultaneously whereby the facsimile machine 16 will directly connect with facsimile machine 18, although the signal is being processed through the local node 8. Thus, the facsimile machine 18 has a unique
25 and conventional telephone number address without a dedicated telephone line, however, the telephone number address of facsimile machine 18, when used, results in a telephone communication being established between the originating data transmitting/receiving device and the
30 local node 8. The local node 8 then routes the data appropriately to the facsimile machine 18.

A further advantage of this arrangement is that simultaneous transmissions for the destined transmitting/receiving device can be received by the process
35 intermediary for eventual transmission to the destined transmitting/receiving device and similarly, transmissions can be received by the process intermediary for the destined transmitting/receiving device when it is

transmitting data. Therefore, this arrangement increases the momentary capacity of the receiving device while reducing the requirements thereof, thereby ensuring that originating transmitting/receiving devices do not
5 experience busy signals when the destined transmitting/receiving device is in use as long as the capacity of the process intermediary has not been exceeded.

In the case of long distance communications, the signal would be processed within the digital data network
10 from one local node to a local node in close proximity to the destined transmitting/receiving device. Thus, long distance data transmissions are transmitted over the more efficient digital data network. Non-long distance communications are generally routed through the public
15 switched telephone network. It is more appropriate to use the public switched network for local calls as there is no additional cost and the quality of the connection between one data transmitting/receiving device and the other is relatively high. In the case of long distance telephone
20 communications, the channel quality is often suspect, particularly for data transmissions, and therefore it is more appropriate to use the efficient digital data network which is specifically designed for the transmission of data whereby higher quality and lower costs can be
25 realized.

With the present invention, it is possible to allow people to select a different form of data transmission or facsimile service which involves the process intermediary while the general public cannot
30 distinguish between this facsimile service and that of a dedicated line. This is obviously preferred as the originator will not experience any difficulty in completing the transmission as it is initiated in an identical manner to standard data or facsimile
35 transmissions. The local area node can have a very sophisticated capability for receiving diverse data transmission signals and can also have the capability for translating these signals into an appropriate format which

can be received by the data transmitting/receiving device for which the information is destined. For example, the data could originate in a personal computer and be transmitted to the local node which would recognize that particular format and translate it into an appropriate format for the destined data transmitting/receiving terminal 18. It would also be useful for the process intermediary to be able to modify one data transmission, for example a data transmission developed on an IBMTM personal computer into an appropriate format for the AppleTM personal computer, or between different word processors, or between computers and facsimile machines, or other combinations requiring conversion or processing. In this way, users who recognize that they have incompatible data transmitting/receiving devices could route the data transmission through the process intermediary which would effectively translate the data transmission into an appropriate format and transmit it to the destined transmitting/receiving device. The process intermediary obviously could have very sophisticated hardware and software to carry this out, while the cost for this service could be relatively inexpensive due to the sharing of this capability over a large number of users.

Although various preferred embodiments of the present invention have been described herein in detail, it will be appreciated by those skilled in the art, that variations may be made thereto without departing from the spirit of the invention or the scope of the appended claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A data transmission system (2) having a host of
5 data transmitting and receiving devices (16, 18) and a
process intermediary unit (6) for sending data at least
partially by a telephone system (4) between an originating
data transmitting/receiving device (16, 18) and the
10 destined data transmitting/receiving device via a process
intermediary unit (6); at least some of said data
transmitting/receiving devices (18) including means for
receiving a non-telephone actuation signal and means for
initiating a telephone communication with the process
intermediary unit (6) upon receipt of the actuation
15 signal; characterized in that said process intermediary
unit (6) includes

a) means (8, 10, 14) for receiving
communications destined for one of said data
transmitting/receiving devices (18)
20 identified by a telephone number or telephone
number address (10), and
b) means (8, 22) for producing and transmitting
an appropriate non-telephone actuation signal
when a communication is received and the
25 identified data transmitting/receiving device
(18) is one of said data transmitting/
receiving devices (18) capable of being
actuated by said non-telephone actuation
signal;

30 and wherein said process intermediary unit (6)
includes a plurality of allocated telephone number
addresses (10) which are individually assigned to data
transmitting/receiving devices (18) to be used for
receiving data and wherein each of the individual data
35 transmitting/receiving devices (18) having an assigned
telephone number address is capable of being actuated by
means of the non-telephone actuation signal whereby data
sent to an individual data transmitting/receiving

device (18) having a telephone number address is received by the process intermediary unit (6) and subsequently delivered by the process intermediary unit (6) to the particular data transmitting/receiving device (18) to which the telephone number address (10) has been assigned, the process intermediary unit (6) delivering the data by actuating the individual data transmitting/receiving device via the non-telephone actuation signal and the actuated data transmitting/receiving device (18) initiating a telephone communication with said process intermediary unit (6) through which the data is delivered to the transmitting/receiving device (18).

2. A data transmission system (2) as claimed in claim 1, characterized in that said process intermediary unit (6) includes information associated with each data transmitting/receiving device (18) having an assigned telephone number address whereby data destined for a particular data transmitting/receiving device (18) in a format which cannot be received by said particular data transmitting/receiving device (18) is appropriately translated by the process intermediary unit (6) and transmitted to said particular data transmitting/receiving device (18) in an appropriate format.

3. A data transmission system (2) as claimed in claim 1, characterized in that the data transmitting/receiving devices (18) having assigned telephone number addresses are facsimile machines (18).

4. A data transmission system (2) as claimed in claim 3, characterized in that the process intermediary unit (6) can receive and store both the telephone number address (10) and the data to be received by the destined facsimile machine (18).

5. In long distance transmission of data between transmitting/receiving devices (16, 18) via a process

intermediary unit (6) wherein the transmission of data uses an existing public switched telephone network (4) for transmitting data from an originating transmitting/receiving device (16, 18) to the process intermediary unit (6) and from the process intermediary unit (6) to a destined transmitting/receiving device (18), the improvement comprising said process intermediary unit (6) including a number of local nodes (8) which are interconnected by a digital data transmission network (14) by means of which data, to be transmitted a long distance, received by the process intermediary unit (6) at a local node (8) is transmitted to another appropriate local node (8), and wherein at least some of said data transmitting/receiving devices associated with the process intermediary unit (6) each have a unique telephone number address (10) which when used results in a telephone connection with said process intermediary unit (6) with said telephone number address being recorded and used by the process intermediary unit to identify the receiving device (18) for which the data is destined.

6. A plurality of data transmitting/receiving terminals (18), each terminal having a non-telephone actuation means (20, 30) which when actuated causes said data transmitting/receiving terminal (18) to complete a telephone connection with a process intermediary unit (6) by means of existing telephone networks (4), characterized in that said process intermediary unit (6) has a host of telephone number addresses (10) which are assigned to uniquely identify each of said data transmitting/receiving terminals (18) and when any of the telephone number addresses are used a telephone connection is made with the process intermediary unit (6),

wherein said process intermediary unit (6) upon receipt of a communication for a particular telephone number address (10) transmits a non-telephone actuation signal which is received by a destined transmitting/receiving terminal (18) identified by the telephone number

- 10 -

address which actuates said destined transmitting/receiving terminal (18) to effect a telephone connection with the process intermediary unit (6) and by means of which data destined for the receiving terminal (18) is transmitted thereto by the process intermediary unit (6).

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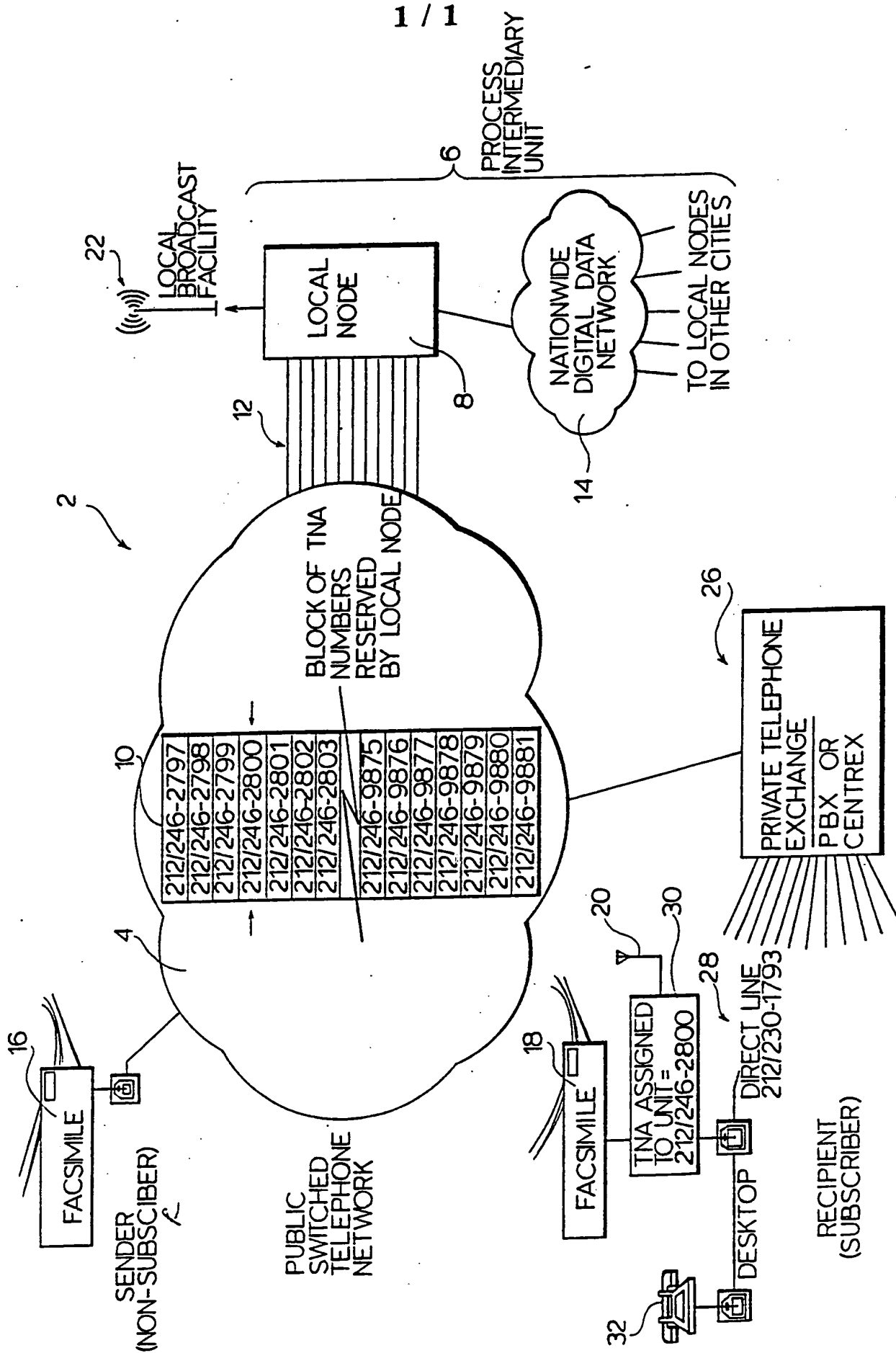
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 90/00150

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC⁵: H 04 M 11/00

II. FIELDS SEARCHED

Minimum Documentation Searched ⁷

Classification System

Classification Symbols

IPC⁵

H 04 M

Documentation Searched other than Minimum Documentation
to the extent that such Documents are included in the Fields Searched *

III. DOCUMENTS CONSIDERED TO BE RELEVANT *

Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	US, A, 4713837 (A. GORDON) 15 December 1987 see column 2, line 13 - column 4, line 9; column 4, line 20 - column 5, line 17; column 6, line 51 - column 7, line 36; figure 1 cited in the application ---	1,6
Y	US, A, 4259549 (C.J. STEHMAN) 31 March 1981 see column 1, line 61 - column 2, line 9; column 12, line 30 - column 15, line 68; figures 3,4 ---	1,6
A	--- ./.	2,4

* Special categories of cited documents: ¹⁰

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search

15th January 1991

Date of Mailing of this International Search Report

25.06.91

International Searching Authority

EUROPEAN PATENT OFFICE

Signature of Authorized Officer

D. Haack

Mme Dagmar FRANK

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

A	GB, A, 2145607 (McGraw Edison Co.) 27 March 1985 see page 2, lines 47-68; page 2, line 82 - page 3, line 72; page 5, lines 5-71 ---	1,6
A	FR, A, 2601485 (SPIE-TRINDEL) 15 January 1988 see page 9, lines 18-30 -----	1,6

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☒ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²

This International Searching Authority found multiple inventions in this international application as follows:

Please refer to Form PCT/ISA/206 dated 19th February 1991

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.
2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:
3. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers: 1-4, 6
4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- ☐ The additional search fees were accompanied by applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

CA 9000150

SA 36657

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 18/06/91. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4713837	15-12-87	WO-A- 8906079 EP-A- 0393023	29-06-89 24-10-90
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FR-A- 2601485	15-01-88	None	